

## ABSTRACT OF THE DISCLOSURE

### METHOD FOR INCREASING THE SIGNAL-TO-NOISE RATIO IN IR-BASED EYE GAZE TRACKERS

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10 The accuracy of eye gaze trackers is used in the  
presence of ambient light, such as sunlight, is improved.  
The intensity of sunlight and its constituent wavelengths of  
light, such as infrared radiation, do not vary rapidly.  
During the inter-frame interval of video cameras (typically  
1/30th of a second), the level of ambient infrared radiation  
can be considered nearly constant. In a first embodiment,  
the modulation of the IR illuminator is synchronized with  
15 each frame of the camera such that the illuminator  
alternates between on and off with each subsequent frame. If  
one considers a sequence of such frames, then the image  
captured in the first frame contains both the illuminator  
signal and the ambient radiation information. The image  
20 captured in the second frame contains only the ambient  
radiation information. By subtracting the second frame from  
the first frame, a new image is formed that contains only  
the information from the illuminator signal. The resulting  
image can then be used by the conventional eye tracker  
25 system to compute the direction of eye gaze even in the  
presence of an ambient IR source.